

Mensural and moult data for some birds of Martinique, French West Indies

by *Ralph W. Schreiber & Elizabeth Anne Schreiber*

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In late May 1982 we mist netted, measured external characteristics, and collected a small series of birds in 4 diverse habitats on Martinique, French West Indies. Measurements are seldom available for birds in general (Clark 1981), and are rare for Martinique. Wing loading has not been calculated previously for any species in the West Indies. We present our data here, along with notes on moult and other observations.

METHODS

We mist netted: (1) along a newly cut dirt road in a mahogany (*Swietenia* sp.) plantation near the Arboretum just north and into the mountains from Fort-de-France in a mesohygrophile area of *Simaruba amara*, *Inga* sp., *Sloanea* sp., and *Daeryodes excelsa*; (2) in the Forêt Dominale des Trois-Îlets along Highway D-7 in a xeric region of *Rbizophora*, *Conocarpus*, *Croton*, *Eugenia*, and *Andropogon* beside a lagoon directly connecting to the Caribbean Sea; (3) in an urban area at the Office National des Forêts, Route de Moutte, Fort-de-France; and (4) at the ruins of Creve Coeur, near Saint Anne, in xeric shrubs on a hillside.

Linear measurements were taken with a Vernier caliper and metre stick, and we used various Pesola spring balances. We measured the exposed culmen, exposed tarsus, tail, the weight, and the wing span of fully extended, but not tightly stretched, wings and across the longest distance of the wings. We traced body and wing outlines on large paper with the wings fully extended and the dead bird ventral side down. We did not trace the neck and head outlines but did the tail approximately half spread (40°-50°). We used a compensating polar planimeter (Keuffel and Esser Co.) to trace the wing, body and tail outlines, giving areas in cm². In another study (Schreiber & Schreiber, in prep.), on the birds of Corrientes, Argentina, we determined with repeat tracings of single birds that our results on each tracing of a wing and tail area were within ±4% of each other. All measurements and tracings were made within 2 hours of mist netting the birds. Wing loading is calculated by dividing weight by wing area (which includes the area of the body

between the 2 wings). We used the Diversity Index
$$H = \frac{n \log n - \sum_{i=1}^k f_i \log f_i}{n}$$

where f_1 = individuals of species i ; k = total number of all individuals of all species; and n = number of species (Zar 1974). We used BMDP software to perform calculations. We preserved birds as spirit specimens (injected with 10% formalin and stored in 70% alcohol), study skins, or a combination of skeleton and flat skin. We did not determine sex on spirit specimens but sexed all others.

TABLE I

Birds captured in various habitats on Martinique, French West Indies, May 1982.

Species	Numbers (includes individuals released)				Total Captured	
	Wet Mahogany forest 18-19 May	Coastal, Forêt des Trois-Ilets. 20 May	Urban yard. Route de Moutte. 21 May	Dry Forest, Creve Coeur. 23 May	n	%
1 <i>Eulampis jugularis</i> Purple-throated Carib	26	1	0	0	27	17
2 <i>Sericotes holosericeus</i> Green-throated Carib	2	0	1	0	3	2
3 <i>Ortobryncus cristatus</i> Antillean Crested Hummingbird	0	0	0	1	1	1
4 <i>Elaenia martinica</i> Caribbean Elaenia	3	2	3	2	10	6
5 <i>Margarops fuscus</i> Scaly-breasted Thrasher	1	0	0	0	1	1
6 <i>Turdus nudigenis</i> Bare-eyed Thrush	1	0	0	0	1	1
7 <i>Myadestes genibarbis</i> Rufous-throated Solitaire	1	0	0	0	1	1
8 <i>Vireo olivaceus</i> Red-eyed Vireo	0	1	0	0	1	1
9 <i>Vireo altiloquus</i> Black-whiskered Vireo	0	2	0	2	4	3
10 <i>Dendroica petechia</i> Yellow Warbler	0	0	0	1	1	1
11 <i>Coereba flaveola</i> Bananaquit	14	5	13	3	35	22
12 <i>Quiscalus lugubris</i> Carib Grackle	1	10	4	0	15	9
13 <i>Icterus bonana</i> Martinique Oriole	1	0	0	0	1	1
14 <i>Loxigilla noctis</i> Lesser Antillean Bullfinch	17	5	10	1	32	20
15 <i>Tiaris bicolor</i> Black-faced Grassquit	1	8	1	9	18	11
16 <i>Saltator albicollis</i> Streaked Saltator	2	1	1	3	7	4
Number of individuals	70	35	33	22	158	100
Number of net hours	108	45	45	27	225	
Number of species	12	9	7	8	16	
Species per net hour	0.111	0.200	0.155	0.296	0.07	
Birds per net hour	0.65	0.75	0.71	0.82	0.70	
Diversity Index	1.736	1.883	1.520	1.767		

RESULTS AND DISCUSSION

In Table 1 the 16 species we captured are listed by habitat type, with species caught per net hour, total birds per net hour, and a Diversity Index. Numbers beside the scientific name are used in Fig. 1 to represent the species. The dry, hilly scrub forest at Creve Coeur appears to have somewhat higher diversity and a greater abundance of birds than the other 3 habitats. The wet mahogany plantation had the lowest diversity and abundance, as we expected, since it is primarily a mono-culture, although the undergrowth is lush. Our sample size from only one season, however, is too small to make any generalizations. We did not observe any species that we did not capture in our mist nets. There appear to be a few common species and many rare or uncommon

TABLE 2

Meristics of species captured on Martinique, French West Indies, May 1982. Data include the mean±1 standard deviation and the range.

Scientific Name	Nature of specimens	Gulmen (mm)	Wing chord (mm)	External tarsus (mm)	Tail (mm)	Weight (gm)	Wing area (cm ²)	Tail area (cm ²)	Wing span (mm)	Wing Loading gm/cm ²
<i>Eulampis jugularis</i>	AL=15	24.0±2.81	75.9±4.19	5.9±0.34	40.7±2.54	9.3±1.35	36.3±2.7	13.4±1.55	175.2±7.3	0.257±0.032
	SN=3	17.5±27.5	70.0-84.0	5.0-6.5	36.0-46.0	7.5-12.0	32.3-40.5	10.4-16.0	165-189	0.21-0.31
	KB=1									
<i>Sericotes holosericeus</i>	AL=3	27.7±3.18	63.5±2.12	5.2±0.35	34.5±0.71	5.6±0.07	25.6±0.14	11.5±2.76	151	0.221±0.002
	AL=1	25.5±30.0	62.0-65.0	5.0-5.5	34.0-35.0	5.6-5.7	25.5-25.7	9.6-13.5		0.220-0.222
	AL=7	10.0	50.0	4.5	32.0	2.7	17.0	6.4	119	0.159
<i>Orthorhynchus cristatus</i>	AL=1	12.5±1.41	80.0±5.09	20.0±1.83	68.5±7.19	11.3±1.26	109.6±9.55	16.0±3.51	223.5±8.18	0.196±0.02
	SN=5	11.5-13.5	73.0-85.0	18.0-22.0	62.0-78.0	19.5-22.3	97.8-117.4	13.0-21.1	213.0-230.0	0.183-0.228
	KB=2	12.5±0	84.7±1.53	20.0±0	71.3±2.89	22.0±0.36	115.4±5.23	18.7±3.24	251.0±8.19	0.180±0.011
<i>Margarops fuscus</i>	AL=1	19.5	117	29.0	90.0	64.0	215.3	41.0	309.0	0.297
	AL=1	21.0	122	31.0	95.0	59.0	250.1	40.0	332.0	0.236
	AL=1	8.5	90	—	85.0	30.0	132.7	33.5	248.0	0.226
<i>Myadestes genibarbis</i>	AL=1	13.0	73	20.0	46.0	14.5	78.0	11.0	220.0	0.186
	AL=1	16.4±0.42	80.8±3.56	20.8±1.30	57.2±2.17	19.9±1.72	111.6±3.95	13.9±2.79	237.6±10.55	0.179±0.018
	SN=1	16.0-17.0	78.0-86.0	20.0-23.0	55.0-60.0	18.0-22.6	107.0-116.5	10.8-17.0	219.0-245.0	0.157-0.208
<i>Vireo olivaceus</i>	AL=1	19.0	85.0	26.0	80.0	29.0	—	—	—	—
	AL=1	13.0	59.0	18.5	43.0	9.7	65.8	10.0	179.0	0.147
	AL=12	14.9±3.06	57.2±2.17	17.3±0.67	39.0±3.00	10.1±1.47	64.2±3.27	6.0±1.08	170.5±4.44	0.165±0.012
<i>Vireo altiloquus</i>	SN=15	13.0-19.5	54.0-60.5	16.5-18.0	30.0-44.0	8.4-12.0	57.3-70.1	5.1-7.4	166.0-176.0	0.147-0.174
	♂	15.3±1.93	61.5±2.76	18.3±0.68	41.1±3.12	10.3±0.41	62.0±3.85	6.9±1.62	178.9±6.97	0.151±0.013
	♀	14.0-20.0	56.0-66.0	17.0-19.0	34.0-45.0	10.0-11.5	66.0-78.1	5.3-10.0	167.0-187.0	0.137-0.174
<i>Quiscalus lugubris</i>	AL=8	23.6±0.69	107.2±2.66	31.4±2.2	85.7±3.38	54.8±3.45	225.7±7.40	28.4±4.92	318.7±6.95	0.246±0.012
	SN=2	22.5-24.5	104.0-110.0	28.0-35.0	80.0-91.0	49.0-58.0	216.8-236.2	30.3-38.3	311.0-331.0	0.225±0.263
	FB=4	27.8±2.36	120.4±2.97	34.4±1.52	99.0±5.79	74.2±4.6	301.6±20.1	40.4±0.49	378.5±14.8	0.254±0.60
<i>Loxia nictis</i>	AL=12	25.5-31.5	116.0-124.0	33.0-36.0	93.0-105.0	70.0-80.0	287.4-315.8	40.0-40.7	368.0-389.0	0.253-0.254
	SN=11	12.3±0.69	68.7±1.06	19.3±1.18	48.0±1.16	18.4±1.09	92.0±2.17	10.4±1.31	206.0±6.17	0.200±0.013
	KB=3	11.5-13.5	67.0-71.0	17.0-21.0	46.0-50.0	16.2-20.0	88.0-94.7	7.5-11.8	198.0-213.0	0.181-0.224
<i>Tiaris bicolor</i>	AL=9	13.1±0.62	74.6±3.38	19.0±0.83	51.3±1.83	19.2±1.74	103.2±4.70	11.4±2.69	217.0±7.89	0.186±0.017
	SN=5	12.0-14.0	69.0-80.0	18.0-21.0	50.0-55.0	15.5-21.2	96.6-111.7	8.0-17.0	206.0-233.0	0.152-0.212
	♀	9.7±0.77	52.0±2.0	16.7±0.58	39.0±1.73	10.3±0.87	57.5±2.91	6.7±1.75	155.7±4.51	0.183±0.011
<i>Salpinctes obsoletus</i>	AL=4	9.9±0.52	50.0-54.0	16.0-17.0	37.0-40.0	9.5-11.0	55.0-60.7	5.0-8.5	151.0-160.0	0.173-0.194
	SN=2	9.5-10.8	51.0-55.0	15.0-18.0	38.0-45.0	71-11.6	54.4-63.0	7.6±1.29	161.4±3.98	0.173±0.033
	♀	20.1±0.90	100.1±4.38	24.9±1.49	86.6±2.07	41.0±4.04	196.9±12.9	31.6±1.73	297.1±9.76	0.208±0.017
<i>Salpinctes obsoletus</i>	SN=2	19.1-22.0	94-105	23.0-27.0	84.0-89.0	37.0-49.0	174.0-215.1	29.8-34.3	282-309	0.185-0.230

Specimen codes: AL=alcoholic entire specimen; FB=flat skin and skeleton; KB=study skin and body skeleton; SN=skeleton complete.

species present on Martinique (Table 1). Most of the central, south and west portions of the island where we worked are very disturbed; if not covered with buildings or crops, much grazing of domestic animals occurs.

Mensural data of the 16 species are summarized in Table 2, including mean, standard deviation, and range. Males and females of some species are segregated if significant numbers of individuals were involved. Wing loading in these species increases with increasing body weight (Table 2 and Fig. 1). All species fall into the category which Greenwalt (1962) refers to as "all other birds" (mainly passerines).

Few measurement data exist, or have been published, for Caribbean birds and therefore few comparisons are presently possible. The existing data on weights agree closely with our sample (Olson & Angle 1977, Steadman *et al.* 1980, Olson *et al.* 1981, Thomas 1982, Prÿs-Jones 1982). Wing length data for Dominica, the nearest island to the north of Martinique, also are similar to our measurements (Prÿs-Jones 1982). Clearly further data for all West Indian islands are needed, preferably samples collected throughout one or more years.

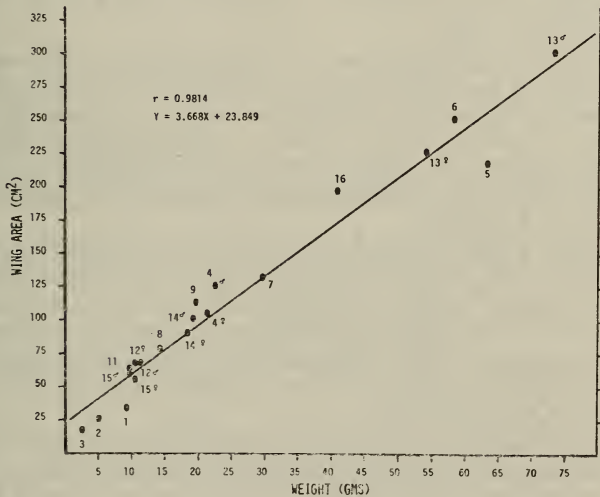


Fig. 1. Relation between weight and wing area for 16 species of birds on Martinique, French West Indies. Numbers refer to species as listed on left margin of Table 1.

SPECIES ACCOUNTS

Eulampis jugularis Purple-throated Carib. This hummingbird was very abundant in the mahogany forest and a few were present at Forêt des Trois-Ilets, but it was absent from lowland and dry regions (Table 1). Most birds had a heavy infestation of mites in the nostrils and the feathers at the base of the bill. Only 3 were not moulting and these 3 weighed 8-9 g; all others were either in heavy body moult (weighing 8-12 g) or had heavy body and primary moult (10.5-10.7 g). Of these last (n=8), 6 had primaries 1-3 or 1-5 (from carpal joint outwards) sheathed and growing, causing obvious gaps in the usual wing contour. Prÿs-Jones (1982) did not mention this condition for

birds from Dominica in July/August and we wonder if this situation exists in other populations. Ovaries of 2 females were fine granular and measured 4 x 3 mm and 6 x 3 mm; 2 males had left testes 1.5 x 1 mm and 5 x 3 mm. Only a small amount of sexual dimorphism is evident from our sample, with males somewhat larger than females.

Sericotes holosericeus Green-throated Carib. These humming birds were netted in the hilly, dry forest at Creve Coeur and in the urban yard. None was moulting.

Orthorhyncus cristatus Antillean Crested Hummingbird. Only one, captured at Creve Coeur. No moult.

Elaenia martinica Carribean Elaenia. Captured in all habitats in equal numbers. No birds were moulting but the tails were worn. Ovaries of 4 females were 10 x 4, 9 x 7, 9 x 5 and 8 x 5 mm and 2 had enlarged ova 2-3 mm in diameter. In 3 males the left testes were 12 x 6, 10 x 7 and 8 x 5 mm, probably indicating onset of breeding.

Margarops fuscus Scaly-breasted Thrasher. One was captured in mahogany forest; it had very worn plumage, especially in the tail and wing coverts, but was not moulting.

Turdus nudigenis Bare-eyed Thrush. One was captured in the mahogany forest. It showed no moult.

Myadestes genibarbis Rufous-throated Solitaire. Only one was captured, in mahogany forest. It had heavy lesions caused by *Knemidokoptes* mite infestation, the so-called "tassel-foot" (see Keymer 1982: 583-586 and Figs. 25-37).

Vireo olivaceus Red-eyed Vireo. Probably a very late migrant (Bond 1979), this bird was captured (20 May) along the coast at Trois-Ilets. The wing formula of this female (ovary fine granular 3 x 1 mm) fits the North American breeding race *V. o. olivaceus*.

Vireo altiloquus Black-whiskered Vireo. Two were netted along the coast and 2 in the xeric hills. Rectrices were worn but no moult was present. One female had an enlarged oviduct, ovary 8 x 6 mm and 6 ova 2 mm in diameter.

Dendroica petechia ruficapilla Yellow Warbler. The only one captured was in the xeric hills and had a reddish head and throat. This habitat seems unusual since in most Caribbean locations Yellow Warblers are confined primarily to mangroves (A. Cruz, June 1983).

Coereba flaveola Bananaquit. The most common species caught, Bananaquits were most numerous in mahogany forest and urban areas. Of the 15 skeletons preserved, 10 were males and 5 females. Of the males one juvenile had a testis 1 x 0.5 mm, those of the rest measuring 7.3-1.3 x 5.1-1.5 mm. Only one male was moulting and the rest had primaries and especially rectrices, very worn. On one the outer right rectrix was one-half grown. Ovaries measured 5 x 4 to 8 x 4 mm and most ova were 1-3 mm. One female had all ova 0.5 mm, the other 4 had enlarged oviducts, and one contained a 10 mm ovum in the duct and 2-3 shed follicles. None was moulting and the plumage was not especially worn, as it was in the males. Of our 12 spirit specimens, 5 were juveniles, with yellow superciliary stripes. None was moulting and our moult data agree closely with those of Prÿs-Jones for Dominica in 1978. Our wing length data indicate that males are significantly larger than females ($t=2.27$, $p>0.05$) as Diamond (1973) found on Jamaica. Males were also larger in tarsus length ($t=2.61$, $p>0.05$), wing area ($t=2.88$, $p>0.05$), and wing span ($t=2.66$, $p>0.05$).

Quiscalus lugubris Carib Grackle. These were netted most commonly along the coast in noisy mixed flocks of both sexes. In 4 females the ovaries ranged 8.15 x 3.6 mm. One female had a 15 mm yolk in the enlarged oviduct and 1 unshed 12 mm ovum. In another the ovary measured 8 x 3 mm, with several recently shed follicles, while the enlarged oviduct seemed to be regressing. The one male's left testis measured was 9 x 7 mm. These data indicate an extended breeding season in spring 1982 and only further data will determine if this is usual, although we suspect that it is. Males are significantly larger than females: culmen length ($t=3.88$, $p>0.02$), wing length ($t=7.72$, $p>0.001$), tarsus length ($t=2.90$, $p>0.05$), tail length ($t=5.15$, $p>0.01$), weight ($t=8.12$, $p>0.001$), wing area ($t=9.07$, $p>0.001$), and wing span ($t=8.49$, $p>0.001$). Wing loading is not significantly different.

Icterus bonana Martinique Oriole. Only one was captured, in the mahogany forest. It was not moulting.

Loxigilla noctis noctis Lesser Antillean Bullfinch. Bullfinches, the second most common bird encountered, were found in all habitats, most commonly in the mahogany forest and urban yard. Ovaries ranged 9.6 x 7.3 mm. Two females had enlarged oviducts and ova of 2 mm, but our sample seems to indicate that no breeding was occurring in late May. Testes ranged 9.3 x 2.6 mm. No moult was noted and feathers did not seem worn. Males were significantly larger than females in most measurements: culmen length ($t=2.56$, $p>0.05$), wing length ($t=5.21$, $p>0.001$), tail ($t=4.65$, $p>0.01$), and wing area ($t=6.59$, $p>0.001$). Tarsus length, weight and wing loading were not significantly different.

Tiaris bicolor Black-faced Grassquit. Grassquits were uncommon in the mahogany forest and urban yard, but common in coastal scrub and dry, hilly scrub. In a small sample, ovaries were 6 x 9 mm and testes 8 x 5 mm. One female had an enlarged oviduct and one ovum 4 mm and 4 ova 2.5 mm; all were distinctly yellow in colour. Primaries 1 and 2 of one immature were 3/4ths grown in both wings; the remaining primaries, secondaries, and rectrices were old. No moult was present in other birds.

Saltator albicollis Streaked Saltator. Found in small numbers in all habitats. The one male sexed had a right testis 11 x 11 mm and the left 6 x 4 mm. All birds had very worn primaries, secondaries, and rectrices, but only one showed any moult; the second from outer right rectrix was 7/8th grown. The bills on all but one were tan coloured, and one had an orange tip with a very shiny black base.

All the specimens collected are housed at the LACMNH and are available to interested individuals for further study.

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References:

- Bond, J. 1979. *Birds of the West Indies*. 4th ed. Collins: London.
 Clark, G. A. Jr. 1981. Body weights of birds: A review. *Condor* 81: 193-202.

- Diamond, A. W. 1973. Altitudinal variation in a resident and migrant passerine on Jamaica. *Auk* 90: 610-618.
- Greenwalt, C. H. 1962. Dimensional relationships for flying animals. *Smithsonian Misc. Coll.* 144: 1-46.
- Keymer, I. F. 1982. *Parasitic Diseases*. pp. 535-598. In M. L. Petrak, (Ed.) *Diseases of Cage and Aviary Birds*. Lea & Febiger: Philadelphia.
- Olson, S. L. & Angle, J. P. 1977. Weights of some Puerto Rican Birds. *Bull. Brit. Orn. Cl.* 97: 105-107.
- Olson, S. L., James, H. F. & Meister, C. A. 1981. Winter field notes and specimen weights of Cayman Island birds. *Bull. Brit. Orn. Cl.* 101: 341-346.
- Prýs-Jones, R. P. 1982. Molt and weight of some land-birds on Dominica, West Indies. *J. Field Orn.* 53: 352-362.
- Snow, D. W. & Snow, B. K. 1963. Weights and wing-lengths of some Trinidad birds. *Zoologica* 48: 1-12.
- Stadman, D. W., Olson, S. L., Barber, J. C., Meister, C. A. & Melville, M. E. 1980. Weights of some West Indian Birds. *Bull. Brit. Orn. Cl.* 100: 155-157.
- Thomas, B. T. 1982. Weights of some Venezuelan birds. *Bull. Brit. Orn. Cl.* 102: 48-52.
- Zar, J. H. 1974. *Biostatistical Analysis*. Prentice-Hall, Inc.: New York.

Address: Dr. R. W. and E. A. Schreiber, Section of Ornithology, Natural History Museum of Los Angeles County, 900 Exposition Blvd., Los Angeles, Ca. 90007.

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An additional specimen of the Swallow-tailed Cotinga *Phibalura flavirostris boliviana*

by Niels Krabbe

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During a recent examination of the collection of birds in the Zoological Museum, University of Copenhagen, I discovered a mounted specimen of the Swallow-tailed Cotinga *Phibalura flavirostris boliviana*, a subspecies previously known only from 2 specimens, a male and a female, both collected at Atten, Aplobamba, Yungas of La Paz, Bolivia, by R. S. Williams on 6 and 20 August 1902, and preserved in the American Museum of Natural History (AMNH) (Chapman 1930, Snow 1983).

The newly discovered specimen and some other Bolivian birds were mailed in a cardboard box labelled "Yungas von La Paz" to the museum as a present from the Danish Consul General in Lima, H. Witt. The specimens were received on 6 January 1847, and the cotinga was mounted 12 June 1848. The curator of the museum at the time, J. Reinhardt, labelled the bird *Phibalura boliviensis*, and wrote a note in the accession journal of the museum, saying that the bird was new to the region, that it had a pure yellow throat in spite of extensive green edging on wing and tail and that it furthermore had the 1st (outer) primary decidedly shorter than the 4th (in *P.f. flavirostris* the 1st is equal to the 4th or longer). He therefore considered it a problematic species. However, he apparently never published the record, and the manuscript name applied by him is now invalid according to the International Code of Zoological Nomenclature.